Drinking Water Safety in Newfoundland and Labrador

ANNUAL REPORT 2016

Newfoundland Labrador

Municipal Affairs and Environment

For additional copies, please contact:

Water Resources Management Division
Department of Municipal Affairs and Environment
Government of Newfoundland and Labrador
PO Box 8700, St. John's NL A1B 4J6

Telephone: (709) 729-2563
Fax: (709) 729-0320

This document is available electronically at:
www.mae.gov.nl.ca/waterres/reports/index.html#drinkingwatersafety

Printed on recycled paper

Photo Credits: All Photos Copyrighted by the Department of Municipal Affairs and Environment

Executive Summary

This is the 15th annual report prepared by the Department of Municipal Affairs and Environment, Government of Newfoundland and Labrador. This report describes the initiatives, activities and accomplishments pertaining to the Multi-Barrier Strategic Action Plan (MBSAP) for drinking water safety of public drinking water systems for the 2015–16 fiscal year.

Highlights of MBSAP component indicators for the 2015–16 fiscal year include:

Level I

- 311 protected public water supply areas
- 207 land use referrals reviewed for proposed activities concerning protected public water supply areas
- 486 disinfection systems, 131 drinking water treatment systems, 19 water treatment plants (WTPs), and 29 potable water dispensing units (PWDUs)
- 92 permits for development activity in a protected public water supply area
- 5 watershed management committees
- $10,900,000 approved for water infrastructure projects
- 151 permits to construct water and sewer infrastructure

Level II

- 216 active boil water advisories as of March 31, 2016
- 19,801 bacteriological samples and 3,695 chemical and physical water quality samples were collected
- Bacteriological and chemical drinking water quality exceedances recorded
- 1,195 community drinking water quality reports published
- 21 regulatory inspections performed
- 24 education and 147 on-site training seminars conducted
- 399 certified water or wastewater system operators
- 259 participants at the 2016 Annual Drinking Water Safety Workshop
- Corrective measures undertaken

Level III

- *Development of Standard Operating Procedures for the Reduction of Boil Water Advisories in Newfoundland and Labrador*
- A video addressing common questions relating to Permits for Development in PPWSAs in Newfoundland and Labrador

Contents

Executive Summary i

Figures iii

Tables iii

Message from the Minister iv

Introduction 1

Level I 2

Source Water Protection 2
Drinking Water Treatment 4
Drinking Water Distribution 6

Level II 9

Monitoring 9
Data Management and Reporting 16
Inspection and Enforcement 16
Operator Education, Training, and Certification 16
Corrective Measures 19

Level III 21

Legislative and Policy Frameworks 21
Public Involvement and Awareness 22
Guidelines, Standards, and Objectives 22
Research and Development 22

APPENDICES

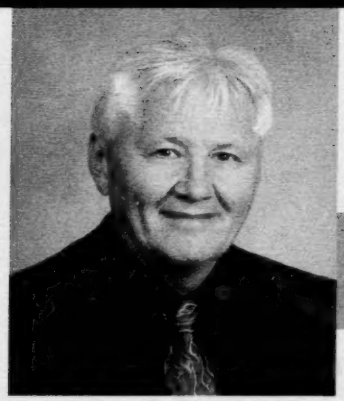
Weblinks 23

Figures

Figure 1: The Multi-Barrier Strategic Action Plan 1
Figure 2: Status of Public Water Sources 2
Figure 3: Type of Development Permits 3
Figure 4: Permits Issued per Fiscal Year 4
Figure 5: Chlorination Systems Used in Newfoundland and Labrador 5
Figure 6: Water Treatment Plants per Fiscal Year 6
Figure 7: Number of Permits to Construct per Fiscal Year 7
Figure 8: Bacteriological Samples Tested per Fiscal Year 9
Figure 9: Unsatisfactory Bacteriological Samples per Fiscal Year 11
Figure 10: Number of BWAs and Number of Communities Affected 11
Figure 11: Reasons for BWAs 12

Tables

Table 1: Number of Referrals Processed 3
Table 2: Number of Disinfection Systems in Newfoundland and Labrador 4
Table 3: Number of Water Treatment Systems in Newfoundland and Labrador 5
Table 4: Public Water Distribution System Classes for 2015–16 6
Table 5: Funding Approved for 2015–16 7
Table 6: Number of Bacteriological Samples Tested in Each Region for 2015–16 10
Table 7: Number of Unsatisfactory Samples for Total Coliforms for 2015–16 10
Table 8: Number of Unsatisfactory Samples for E. coli for 2015–16 10
Table 9: Number of Samples Taken by the Department for 2015–16 12
Table 10: Number of Samples Scheduled and Collected by the Department for 2015–16 14
Table 11: Exceedances per Fiscal Year 15
Table 12: Types of Public Reports Produced by the Department 17
Table 13: Inspections by the Department for 2015–16 17
Table 14: Total Number of Operator Certificates Issued for 2015–16 19
Table 15: Number of Communities Employing Certified Operators 19
Table 16: Corrective Measures Undertaken for 2015–16 20



Message from the Minister

As the Minister of Municipal Affairs and Environment, I am pleased to present the 2016 Annual Report on Drinking Water Safety in Newfoundland and Labrador. This report highlights the accomplishments and new initiatives undertaken through the Multi-Barrier Strategic Action Plan over the past fiscal year.

The Multi-Barrier Strategic Action Plan, one of the most widely adopted and well-established sourcewater protection programs in the country, provides the framework for Newfoundland and Labrador's Drinking Water Program. A comprehensive and adaptive framework for managing and ensuring the safety of public drinking water systems, the plan remains a joint effort of the departments of Municipal Affairs and Environment, Health and Community Services, Service NL, and the province's Regional Health Authorities. This initiative compliments commitments outlined in "The Way Forward: A Vision for Sustainability and Growth in Newfoundland and Labrador," available online at www.gov.nl.ca. The vision guides Provincial Government actions to achieve greater efficiency, strengthen the province's economic foundation, enhance services, and improve outcomes to promote a healthy and prosperous province.

I am pleased to share some of the highlights of the past year, including the department's progress in protecting source-water through the introduction of a new watershed sensitivity classification system; the development of a new training and certification category for potable water dispensing unit operators; as well as improvements to standard operating procedures that have been established to assist in the reduction of active boil water advisories.

The department has been tasked with developing a water quality action plan to address infrastructure, expertise, and technology to ensure our provincial water systems are safe and sustainable, with the mission of reducing the number of long-term boil water advisories to the greatest extent possible. This would not be possible without the efforts of the staff of the department and all participants in the Multi-Barrier Strategic Action Plan. Your efforts and dedication to drinking-water safety are admirable. I thank you for your shared commitment in this task, and I commend the hard work of all those who are involved in providing clean, safe and reliable drinking water to the people of Newfoundland and Labrador.

Eddie Joyce

Honourable Eddie Joyce
Minister of Municipal Affairs and Environment

Introduction

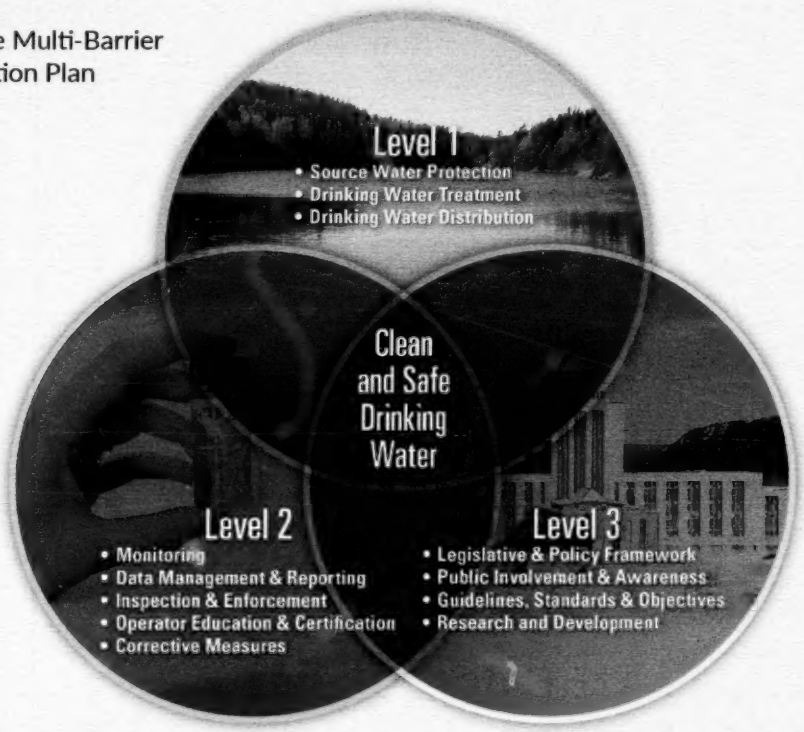
This is the fifteenth annual report on the management of public drinking water systems. This report highlights the initiatives, activities and accomplishments of the departments that implemented the Multi-Barrier Strategic Action Plan (MBSAP) in the 2015–16 fiscal year (April 1, 2015, to March 31, 2016). The report describes the three levels of the MBSAP and their various components (Figure 1). It illustrates how government is implementing the MBSAP. The MBSAP is considered to be the most effective method of managing drinking water systems and has been implemented by other jurisdictions throughout Canada.

The implementation of the MBSAP involves the collaborative efforts of three provincial government departments:

1. **Municipal Affairs and Environment**
2. **Health and Community Services**
3. **Service NL**

In this report, indicators are reported for various components of the MBSAP. Information is reported for the current fiscal year alongside of previous fiscal years, to evaluate performance of the existing drinking water framework. In addition, illustrations of technical work related to drinking water in this province are highlighted in special information boxes.

Figure 1: The Multi-Barrier Strategic Action Plan



Level I

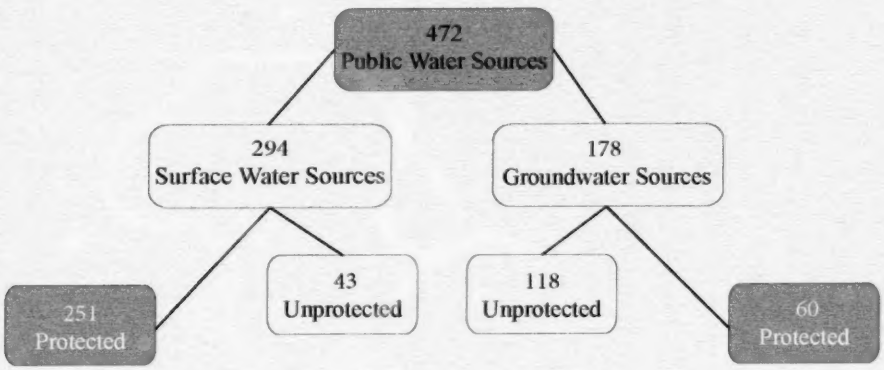
The components of the first level of the MBSAP protect drinking water from the source to the tap.

The three components of Level I of the MBSAP are:
1. source water protection
2. drinking water treatment
3. drinking water distribution

Source Water Protection

Protected public water supply areas (PPWSAs) are protected under section 39 of the *Water Resources Act*. These PPWSAs service a population of 378,880, representing 92% of the population serviced by public drinking water systems. Figure 2 shows the status of public water sources for fiscal year 2015–16.

Figure 2: Status of Public Water Sources



The Department of Municipal Affairs and Environment encourages all communities to begin the protection process for new or existing drinking water sources if they have not already done so.

Watershed Management

The Water Resources Management Division (WRMD) regulates development activities within protected public water supply areas. WRMD uses a number of tools to monitor such activities, including:

- referrals from the Interdepartmental Land Use Committee (ILUC), Fisheries and Land Resources (Crown Lands Administration Division and Land Use Planning Section), Natural Resources and other divisions within MAE (Environmental Assessment (EA))
- permits for development activity
- watershed management plans
- watershed management committees
- community monitoring and inspections
- regulatory inspections

Referrals

In the 2015–16 fiscal year, the WRMD processed 207 referrals from various departments for proposed activities concerning PPWSAs as outlined in Table 1.

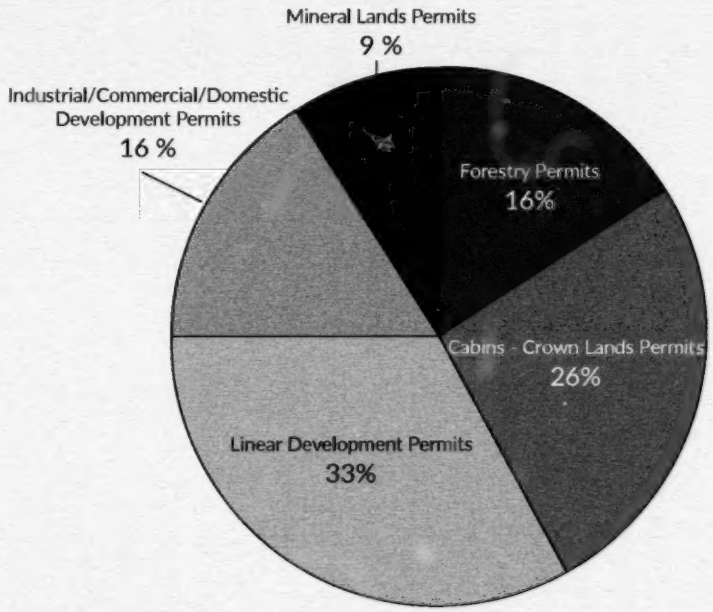
Table 1: Number of Referrals Processed

Type of Referral					
Fisheries and Land Resources (Crown Lands)	Natural Resources	ILUC	Fisheries and Land Resources (Land Use Planning)	Other	Total
70	50	52	6	29	207

Activity Permits

All activities in a PPWSA (either a protected public water supply area, or a wellhead protected water supply area) require a permit under the *Water Resources Act*. During the 2015–16 fiscal year, 92 development activity permits were issued. Figure 3 illustrates the distribution of development permits by type. Figure 4 shows the total number of permits issued for development activities within a PPWSA for each fiscal year since 2011–12.

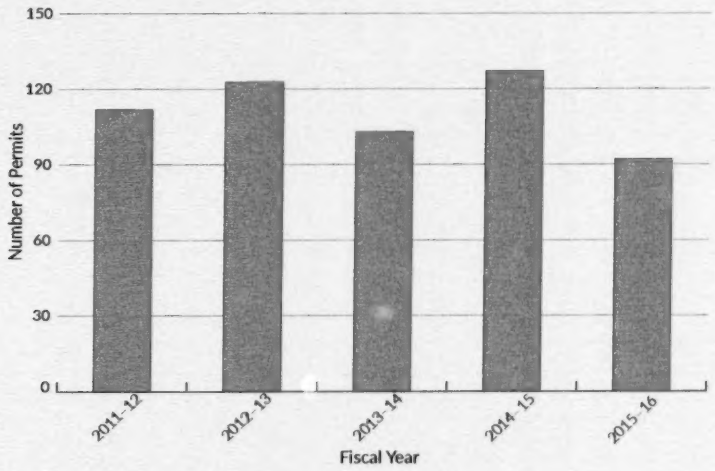
Figure 3: Type of Development Permits



The top two developmental activities for which permits were issued include:

1. linear developments
2. cabins - Crown land developments

Figure 4: Permits Issued per Fiscal Year



Watershed Management Committees

Watershed management committees are formed to oversee land use management, potential development, and resource use conflict inside a PPWSA. Some committees develop watershed management plans (WMP) to help manage the watershed. The active watershed management committees in the province during 2015–16 are located in:

- Clarenville
- Corner Brook (WMP)
- Gander (WMP)
- Grand Falls–Windsor
- Steady Brook (WMP)

Drinking Water Treatment

Several water treatment strategies are used to address different water quality issues and to treat the water before it is consumed.

Disinfection

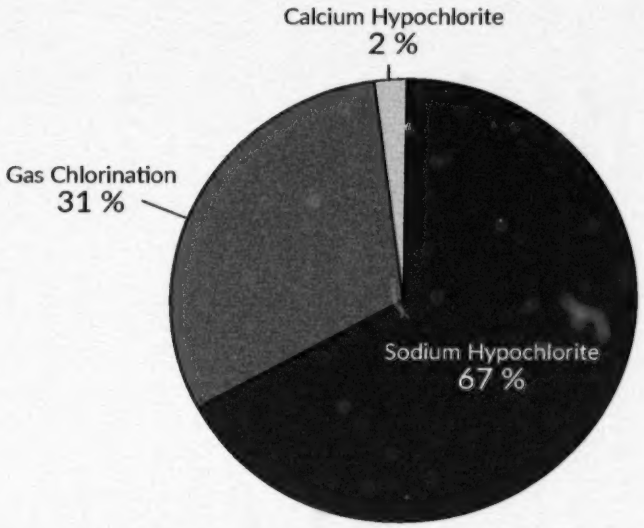
The most critical aspect of water treatment is disinfection as it ensures the pathogenic safety of drinking water. While there are several forms of disinfection used in the treatment of drinking water, chlorination is the most commonly used disinfection method in the province. The different disinfection methods used in the province are listed in Table 2.

Table 2: Number of Disinfection Systems in Newfoundland and Labrador

Type of Disinfection System				
Chlorination	Ultraviolet Light	Mixed Oxidants	Ozone	Chloramines
439	35	7	4	1

Figure 5 illustrates the distribution of different chlorination types in the province in 2015–16.

Figure 5: Chlorination Systems Used in Newfoundland and Labrador



Parameter Specific Drinking Water Treatment

Mitigative measures have been implemented in numerous drinking water systems to alleviate parameter specific water quality challenges. Table 3 shows the number and type of drinking water treatment systems operational in the province as of the 2015–16 fiscal year.

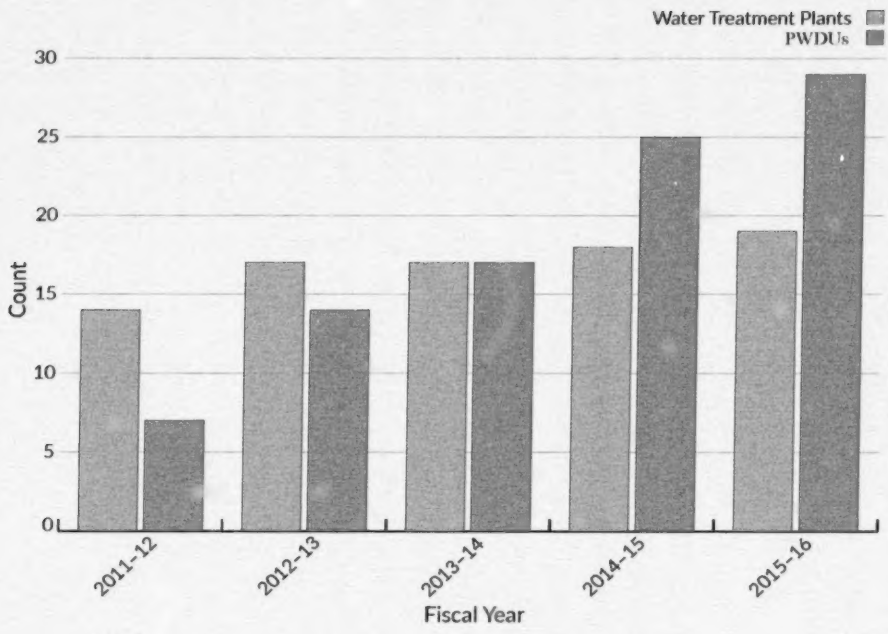
Table 3: Number of Water Treatment Systems in Newfoundland and Labrador

pH adjustment	Micron/ pressure filters	Infiltration galleries	Arsenic removal	Iron/ Manganese removal	Lead removal	Strontium removal
55	34	25	10	5	1	1

Water Treatment Plants

As of March 31, 2016, 48 water treatment plants are in place in Newfoundland and Labrador (this number includes 29 potable water dispensing units (PWDUs)). Figure 6 illustrates the total number of water treatment plants in Newfoundland and Labrador for each fiscal year since 2011–12.

Figure 6: Water Treatment Plants per Fiscal Year



Drinking Water Distribution

The drinking water distribution system is the largest component of physical infrastructure that ensures drinking water safety. It includes all the pipes, valves, service lines, pumping stations, fire hydrants, and storage facilities required to deliver clean and safe drinking water.

In the 2015–16 fiscal year there were 483 public water distribution systems in Newfoundland and Labrador. Table 4 shows the breakdown of the number of water distribution systems in the province for 2015–16. Seventy-four percent of public water distribution systems in Newfoundland and Labrador fall into the "≤ 500" classification.

Table 4: Public Water Distribution System Classes for 2015–16

Size (population)	> 50,000	15,001 - 50,000	1,501 - 15,000	501 - 1,500	≤ 500	Total
Count	1	2	42	82	356	483

**Total number of distribution systems is different from previous years due to the removal of PWDUs and unused water supplies from this calculation.*

During the 2015–16 fiscal year, the Department of Municipal Affairs and Environment approved $10,900,000 for water related projects. Table 5 provides a breakdown of initiatives for the April 1, 2015 to March 31, 2016, fiscal year.

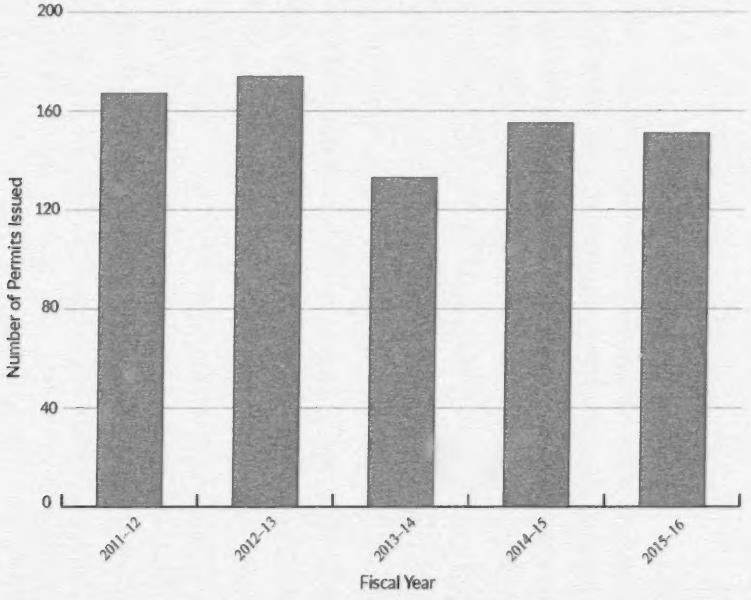
Table 5: Funding Approved for 2015–16

Category	Funding ($)*
New Water Distribution	2,800,000
Upgrades to Water Distribution	6,100,000
New Drinking Water Treatment DWSI/PWDU**	300,000
Upgrades to Drinking Water Treatment	1,400,000
Studies	300,000
Total	**10,900,000**

**Provincial share less GST amounts shown*
***Drinking Water Safety Initiative/Potable Water Dispensing Units.*

In the 2015–16 fiscal year, the Department issued seven permits to operate for drinking water systems and 151 permits to construct under Sections 36, 37 and 38 of the *Water Resources Act*. The total number of active permits to operate for drinking water systems at the end of the 2015–16 fiscal year was 320. Figure 7 shows the number of permits to construct issued for each fiscal year since 2011–12.

Figure 7: Number of Permits to Construct per Fiscal Year



Drinking Water System Report Forms for Communities

In December 2015, the Water Resources Management Division (WRMD) developed a Drinking Water System Report Form. This form was made available to all communities with public drinking water systems in the province. The form was mailed to all communities, made available on the WRMD website, and emailed to communities with a valid email address. The report form contained seventeen questions covering areas such as water treatment, water use, maintenance frequency, operation costs and challenges the community faces during the provision of drinking water to their consumers.

68% of communities submitted the 2015 Drinking Water System Report Form to WRMD. Responses will help WRMD direct certain program activities going forward including:

1. training of newly identified water system operators by OETC
2. increasing the number of protected public water supply areas (PPWSA) and letting communities know their water supply is not protected
3. developing a mail-out familiarizing communities on their PPWSA
4. developing guidance material for operators on what and how often to monitor activities in a PPWSA
5. working with communities to help them understand the importance of daily total and free chlorine residual readings at multiple points in the distribution system
6. increasing the number of water meters on public drinking water systems
7. working with operators to understand flow meter readings, units, calibration and flow record keeping
8. developing water conservation awareness raising material
9. examining causes for high water usage in communities with high flows and possible targeting for leak detection training

Due to the success of the first Drinking Water System Report in 2015, WRMD will continue the practice of requiring an annual report to be filled out by all communities with public drinking water systems every calendar year.

Level II

The standard of performance achieved in Level I of the MBSAP is verified through the components of Level II.

The five components in Level II of the MBSAP are:
1. monitoring
2. data management and reporting
3. inspection and enforcement
4. operator education, training, and certification
5. corrective measures

Monitoring

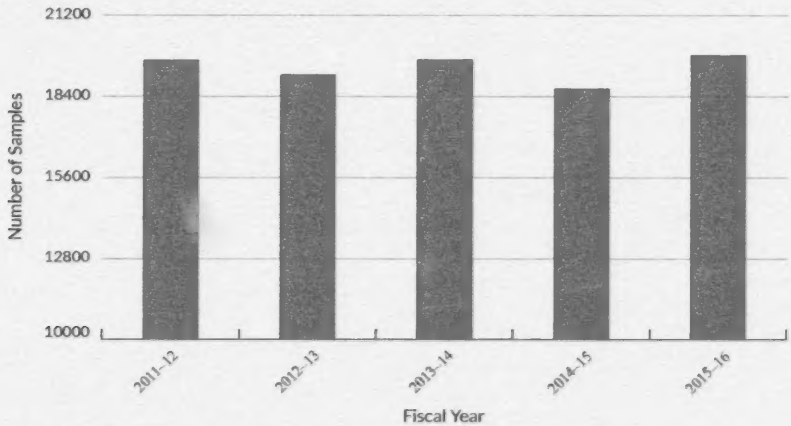
Drinking water quality monitoring consists of regular sampling and testing of drinking water from both the source and the tap. The extensive monitoring program for drinking water quality in the province is a joint responsibility shared by the Departments of Municipal Affairs and Environment, Health and Community Services, and Service NL.

Bacteriological and Chemical Water Quality

Bacteriological Water Quality

Under the direction of Service NL, Environmental Health Officers and Environmental Technicians collect tap water samples from public drinking water supplies for analysis of bacteriological parameters. The parameters monitored include total coliforms and Escherichia coli (E. coli). During the 2015–16 fiscal year, 19,801 public water supply bacteriological samples were collected and tested. Figure 8 shows the total number of bacteriological samples that were collected and tested for each fiscal year since 2011–12.

Figure 8: Bacteriological Samples Tested per Fiscal Year



The number of bacteriological samples tested at each regional drinking water testing facility is shown in Table 6.

Table 6: Number of Bacteriological Samples Tested in Each Region for 2015–16

Region					Total
St. John's	Eastern	Central	Western	Northern	
8,586	1,035	3,879	4,432	1,869	**19,801**

Bacteriological Parameters: Results

Based on the analysis of bacteriological parameters for public drinking water samples taken during the 2015–16 fiscal year, 970 public water supply samples tested were found to be unsatisfactory in terms of total coliforms. An unsatisfactory result indicates the presence of total coliforms and/or *E. coli* bacteria counts in the sample. Table 7 shows the number of samples found to be unsatisfactory for total coliforms, at each regional drinking water testing facility, for the fiscal year 2015–16.

Table 7: Number of Unsatisfactory Samples for Total Coliforms for 2015–16

Region					Total
St. John's	Eastern	Central	Western	Northern	
330	68	210	295	67	**970**

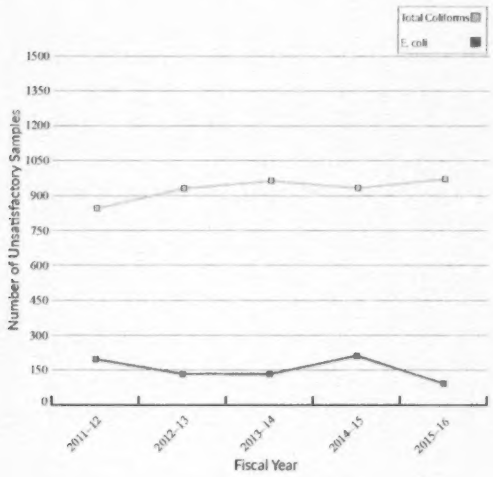
There were 92 bacteriological samples tested that were found to be unsatisfactory in terms of *E. coli*. Table 8 shows the number of samples found to be unsatisfactory for *E. coli*., at each regional drinking water testing facility, for the fiscal year 2015–16.

Table 8: Number of Unsatisfactory Samples for *E. coli* for 2015–16

Region					Total
St. John's	Eastern	Central	Western	Northern	
14	3	13	55	7	92

The number of unsatisfactory samples for total coliforms and *E. coli* for each fiscal year since 2010–11 is shown in Figure 9.

Figure 9: Unsatisfactory Bacteriological Samples per Fiscal Year



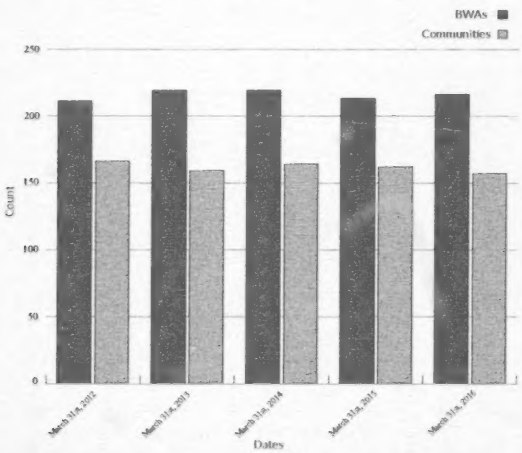
**Escherichia coli (E. coli) is considered a good indicator of recent fecal contamination of drinking water and the possible presence of disease causing microorganisms.*

Boil Water Advisories

Boil water advisories (BWAs) are preventative measures for protecting public health from waterborne microbiological contamination that may, or are known to be, present in drinking water. A BWA is also issued when water quality is questionable due to operational deficiencies (such as inadequate chlorine residual), no disinfection system, or the water in a community's water system is contaminated with bacteriological indicators (such as total coliforms).

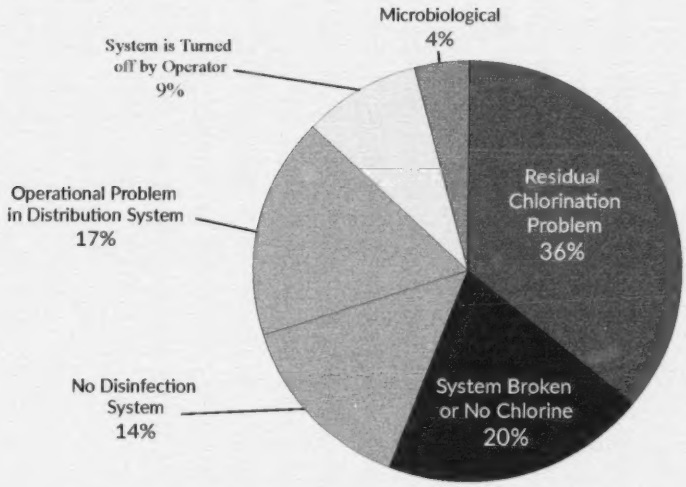
When discussing BWAs for the purpose of this annual report, it is referring to BWAs in effect at the end of the fiscal year, March 31, 2016. Figure 10 shows a historical comparison of BWAs at the end of each fiscal year since March 31, 2012.

Figure 10: Number of BWAs and Number of Communities Affected



On March 31, 2016, 216 BWAs were in effect (this includes long-term BWAs), affecting 157 communities in the province, with an impacted population of 43,943. Figure 11 illustrates the distribution of existing BWAs by reason used to issue the advisory for the 2015–16 fiscal year.

Figure 11: Reasons for BWAs



Long term BWAs are BWAs that have been in effect for a period of five years or greater at the end of the March 31, 2016. A total of 135 BWAs have been in effect for a period of five years or greater.

Chemical and Physical Water Quality

The number of chemical and physical water quality samples taken per region for 2015–16 are presented in Table 9. Analysis of chemical and physical parameters is performed by an accredited lab ensuring that the laboratory provides quality and competency in its sample analysis.

Table 9: Number of Samples Taken by the Department for 2015–16

Region	Source	Tap	THM	HAA	Total
Eastern	37	444	462	461	1,404
Western	23	307	350	351	1,031
Central	30	223	348	348	949
Labrador	9	67	109	109	294
Other (Special)	6	5	3	3	17
Total	**105**	**1,046**	**1,272**	**1,272**	**3,695**

Working With Communities to Remove Long-term BWAs

Long-term BWAs that have been in place for a period of five years or greater can pose quite a challenge for various communities in the Province. One such community is Parkers Cove.

Parkers Cove is a town of approximately 300 people that is located along the shoreline of Placentia Bay on the Burin Peninsula of Newfoundland and Labrador. In cooperation with the Operator Education, Training and Certification (OETC) program, the town has successfully removed their long-term BWA.

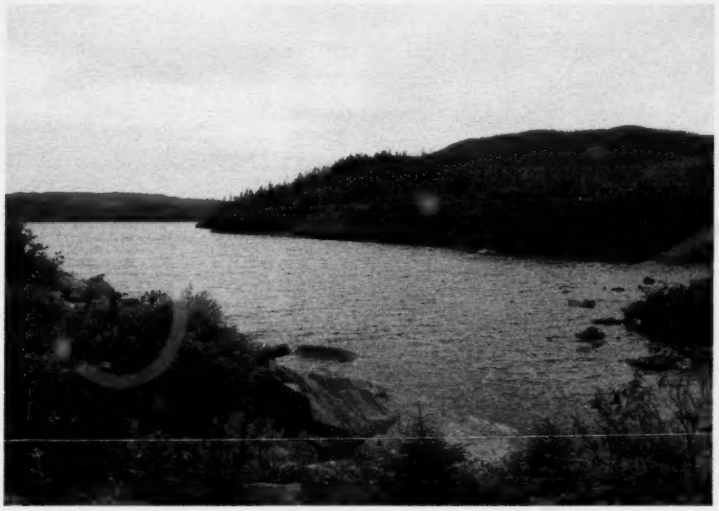
Over the past 5 years, OETC staff have provided multiple training sessions for the town; in 2011, the town's gas system went down and was never repaired due to costs; in 2012, the Town switched from a gas chlorination system to a hypochlorination system; in 2013, a water meter was installed to provide for flow proportional control. Even with these upgrades to the community's water treatment system, the town was still unable to maintain adequate chlorine residuals within their drinking water system.

In consultation with one of OETC's operator-trainers, it was recommended that the town's operators monitor the flow meter and compare the actual water flow with theoretical water flow. The Town of Parkers Cove found that they were using two to three times more water than required to meet their needs. The town was unable to maintain proper chlorine residuals due to water and chemical loss through leaks in the distribution system. As a result, the town staff went looking for leaks and repaired any that were found.

Even with recent upgrades to the community's chlorination system, the long-term BWA could not be removed before the distribution system received the necessary repairs. Without these upgrades and repairs, the system could not be operated effectively.

The long-term BWA for the town of Parkers Cove was lifted on November 10, 2015, after a five year duration. Other communities were able to lift their long-term BWAs during the 2015–16 fiscal year as a result of their own efforts and working collaboratively with the departments of Municipal Affairs and Environment and Service NL which include:

- Burgeo – long-term BWA for six years
- Burlington – long-term BWA for six years
- Forresters Point – long-term BWA for ten years



Unnamed Brook, Parkers Cove

In 2015–16, the department collected 3,695 samples. Ninety-six percent of the samples that were scheduled for this fiscal year were collected. Table 10 shows the number of samples scheduled and the number actually taken for 2015–16.

Table 10: Number of Samples Scheduled and Collected by the Department for 2015–16

Type of Sample	Scheduled	Collected	Percent
Tap	1,097	1,046	95
THM	1,333	1,272	95
HAA	1,333	1,272	95
Source	90	105	>100
Total	**3,853**	**3,695**	**96**

The reasons that some samples were not taken are as follows:

- town was not chlorinating at the time of sampling (THM and HAA samples)
- water supply not operating at the time of sampling (tap, THM and HAA samples)
- no sample location available at the time of sampling (very small systems)

Every year the department schedules special parameter monitoring. In 2015–16, special parameter monitoring programs were conducted for caffeine, bromate and radiological parameters. Bromate and radiological programs will continue into 2016–17.

Chemical and Physical Parameters: Results

Results for chemical and physical parameters are sent to the department when laboratory analysis is complete. The department then evaluates the results by comparing them to current *Guidelines for Canadian Drinking Water Quality* (GCDWQ). Water quality results are compared to the GCDWQ to identify exceedances in chemical and physical parameters that may pose a risk to human health or aesthetic approval of drinking water.

Table 11 summarizes the tap water bacteriological, chemical and physical parameter exceedances for the 2011–12, 2012–13, 2013–14, 2014–15 and 2015–16 fiscal years. When an exceedance is confirmed for a parameter that may pose risk to human health, an exceedance report is sent immediately to the community, as well as the departments of Health and Community Services and Service NL. Exceedances for aesthetic parameters are also reported to communities, along with all other parameter results, in quarterly drinking water quality updates. Communities and the public can access this drinking water quality data through the WRMD's Water Resources Portal online at: www.maps.gov.nl.ca/water/.

The WRMD's sampling and reporting procedures are outlined in the *Drinking Water Quality Monitoring Manual*, which can be viewed online at:
http://www.mae.gov.nl.ca/waterres/quality/drinkingwater/manual.html

Table 11: Exceedances per Fiscal Year

Department	Exceedances						
	Parameters			2011–12	2012–13	2013–14	2014–15	2015–16
Service NL	Bacteriological		Escherichia coli	196	133	132	211	92
			Total coliforms	844	930	962	932	970
Municipal Affairs and Environment	Chemical and Physical		Turbidity	98	103	78	170	83
			Arsenic	4	4	13	6	8
			Barium	2	1	2	1	0
			Fluoride	0	1	0	0	0
			Lead	8	4	2	4	6
	Disinfection By-Products		Trihalomethanes (THMs)	129	132	117	93	108
			Haloacetic Acids (HAAs)	165	147	153	117	134
	Aesthetic		Colour	514	433	466	307	424
			pH	361	335	368	196	225
			Total Dissolved Solids	11	17	19	11	17
			Chloride	3	6	5	2	7
			Sodium	3	4	3	2	7
			Sulphate	3	2	2	1	0
			Copper	11	1	5	9	7
			Iron	107	113	127	86	102
			Manganese	83	106	102	81	68

Data Management and Reporting

The large volume of data acquired during the implementation of the various components of the MBSAP must undergo a stringent quality assurance/quality control (QA/QC) process before it can be compiled, analyzed, and reported to the public. The WRMD strives to collect quality data and report it to the public in an open and timely manner. Table 12 summarizes the reports used to communicate the results from programs related to drinking water quality.

Inspection and Enforcement

The *Water Resources Act* states that a permit holder shall allow inspectors to carry out inspections of an activity for which a license or permit has been issued. Investigations can also occur once the department is made aware of a contravention of the *Water Resources Act* or associated regulations and permits. Departmental staff conduct inspections of water supply systems under construction, the operation of water treatment and distribution systems, groundwater wells being drilled, and activities taking place in PPWSAs to ensure that they comply with the terms and conditions of the permit. Communities should conduct routine surveillance and monitoring for approved development activities within PPWSAs to ensure existing activities are being conducted in an environmentally acceptable manner and that there are no development activities taking place without prior approval from the department. Investigations are typically issue-specific.

In the 2015–16 fiscal year, departmental staff carried out a total of twenty-one inspections/investigations. In addition, staff visited public water supplies two to four times a year during scheduled monitoring work. Table 13 presents a breakdown of inspections for 2015–16.

One of MAE's main goals is to ensure communities achieve clean and safe drinking water in a sustainable and efficient manner. When non-compliance with the conditions of a permit is reported, the WRMD responds to enforce the permit.

Operator Education, Training, and Certification

Certified operators are integral to the proper operation and maintenance of the systems that supply clean and safe drinking water to the consumer. Through continuing education, training, and certification, the department addresses the need for qualified drinking water treatment and distribution system operators in this province. During the 2015–16 fiscal year, twenty-four drinking water related classroom seminars were held at ten locations across the province.

Operator Training

The operator training program provides municipal drinking water system operators with hands-on training opportunities. The program utilizes three mobile training units (MTUs) that have been equipped with various equipment and tools used in the operation and maintenance of drinking water systems. Training sessions are delivered on-site in the operator's community to maximize accessibility to the training opportunities. During 2015–16, the province's three operator trainers conducted 147 on-site training sessions throughout the province. These sessions were attended by a total of 243 participants.

Table 12: Types of Public Reports Produced by the Department

Type	Description
Seasonal Community Drinking Water Quality Updates	As of May 1, 2016, the department switched from paper reporting to a paperless format for all communities with public drinking water systems. Communities are now provided an email when seasonal data is updated. The data is available on the water resources portal. These reports clearly indicate any parameters that exceed the *Guidelines for Canadian Drinking Water Quality*. The province recommends that communities post these reports in public locations. In the 2015–16 fiscal year, 1,195 seasonal community updates were available through the portal.
Exceedance Reports	Exceedance reports are provided to communities when a chemical analysis result is above the *Guidelines for Canadian Drinking Water Quality* for contaminant parameters. These reports are faxed or mailed to the affected community as soon as the department receives the results. In the 2015–16 fiscal year, 14 exceedance reports were sent out to communities, 8 pertaining to arsenic, 6 pertaining to lead.
Annual Drinking Water Safety in Newfoundland and Labrador Report	The Annual Drinking Water Safety in Newfoundland and Labrador Report has been published each year since 2001. It outlines accomplishments and activities under the Multi-Barrier Strategic Action Plan for drinking water safety in a particular fiscal year.
Web Documents on Drinking Water Quality	The WRMD's website is an important tool used to communicate with the public. It is updated regularly with new information on drinking water quality and related topics. The "News and Highlights" screen, lists the most current information and is online at: www.env.gov.nl.ca/env/waterres/whatsnew/index.html

Table 13: Inspections by the Department for 2015–16

Protected Surface Water Supplies	Permits to Operate	Permits to Construct	Protected Groundwater Supplies	Total
6	6	9	0	21

Operator Certification

Certification is an essential component for the operation of a safe drinking water system. There are 399 certified water or wastewater operators in Newfoundland and Labrador. Sixty-one operators achieved their first level of certification in 2015–16. Table 14 contains the total number of operator certificates issued by classification.

2016 Operator of the Year Awards

The Operator of the Year Awards were created to recognize the outstanding dedication of municipal operators in providing clean and safe drinking water. Community representatives across the province were invited to nominate an operator they felt had made an outstanding contribution. In total, 33 nominations were submitted to the selection committee for consideration in two categories: Volunteer Operator of the Year and Operator of the Year.

The Volunteer Operator of the Year Award was created to honour an individual that operates a municipal drinking water system without any monetary compensation. The 2016 Award was presented to Mr. Harold Legge from the No'kmaq Village – the Flat Bay Band Inc. In 2012, the Flat Bay West Water and Waste Committee was formed to address numerous leakage issues in their water distribution system. Mr. Legge is the Chairperson of this committee and has worked relentlessly to improve the condition of their drinking water system. His efforts have resulted in the removal of a long-term Boil Water Advisory that had been in place for over 10 years. Harold has availed of numerous training and educational opportunities and has a long-term financial plan for the community that will ensure the water system financially protected for years to come.

The 2016 Operator of the Year Award was presented to Mr. Dale Walsh, Town of Bay de Verde. Mr. Walsh has worked with the Town of Bay de Verde for over 18 years. During that time, he has been actively involved in training opportunities and has successfully achieved his Class I Water Distribution Certification and Class I Wastewater Collection Certification. He continues to work towards achieving his Class II certification in both disciplines. Dale is a very loyal, dedicated, and trustworthy water system operator who is always trying to improve the quality of life for residents in his small rural community. His dedication to the Town of Bay de Verde is outstanding and they were pleased to nominate him for the 2016 Operator of the Year Award.

Mr. Harold Legge, recipient of the 2016 Volunteer Operator of the Year Award

Mr. Dale Walsh, recipient of the 2016 Operator of the Year Award

Table 14: Total Number of Operator Certificates Issued for 2015–16

Water Distribution	Water Treatment	PWDU	Wastewater Collection	Wastewater Treatment	Total Certificates
47	17	5	30	13	112

Table 15 summarizes the number of communities in Newfoundland and Labrador that employ at least one certified operator divided by classification.

Table 15: Number of Communities Employing Certified Operators

Water Distribution	Water Treatment	PWDU	Wastewater Collection	Wastewater Treatment
112	21	3	50	19

**The above numbers do not include industrial facilities that employ certified operators - only municipalities.*

Annual Clean and Safe Drinking Water Workshop

The Annual Clean and Safe Drinking Water Workshop is open to all community operators and administrators. It brings together drinking water quality stakeholders and provides them with opportunities to learn about drinking water safety, to exchange information, and to share experiences. The presentations delivered throughout this event are carefully chosen to address specific challenges faced by small communities in providing clean and safe drinking water.

The 2016 Clean and Safe Drinking Water Workshop took place on March 22 - 24, 2016, in Gander. The workshop attracted 259 participants from across the province and country. A travel subsidy is provided by the Department of Municipal Affairs and Environment to attend the workshop. Communities from the island portion of the province that were approved for the subsidy were reimbursed up to $400, and communities from Labrador that were approved for the subsidy were reimbursed up to $700. The 2017 Annual Clean and Safe Drinking Water Workshop is scheduled for March 28 - 30, 2017.

Corrective Measures

The Level II components of the MBSAP just discussed, provide an ongoing picture of drinking water supply, quality, and infrastructure. The issues identified require the implementation of corrective actions to deal with these challenges. Corrective measures can include structural, non-structural, operational techniques and other best management practices.

There are five classes of corrective measures: policy, design, water system management, water treatment alternatives, and source alternatives. Table 16 shows the progress made in each category of corrective measures.

Table 16: Corrective Measures Undertaken for 2015–16

Corrective Measure	Description
Policy	• Year 15 of the Multi-Barrier Strategic Action Plan for Safe Drinking Water in Newfoundland and Labrador • The Interdepartmental Safe Drinking Water Technical Working Group met 4 times • Drinking Water Treatment Standards for Newfoundland and Labrador under review
Design	• Updating the *Newfoundland and Labrador Guidelines for the Design, Construction and Operation of Water and Sewerage Systems* to the *Newfoundland and Labrador Guidelines for the Design of Drinking Water Systems* underway
Water System Management	• Ongoing operator education, training and certification • Permits to Construct issued relating to water system management: o Water main upgrades and replacement (also includes new watermains)– 92 o New or upgraded pumps or pumphouse– 8 o New or upgraded valves– 7 o New or upgraded flow meter– 2 o Intake upgrades– 3 • 2 community assessments undertaken in response to drinking water quality issues (Isle aux Morts, Heart's Delight) • 6 Permit to Operate Drinking Water Inspection Reports and Inspection Risk Ratings (Lumsden, Musgrave Harbour, Heart's Delight-Islington, Come By Chance, Marystown, Corner Brook)
Water Treatment Alternatives	• Permits to Construct issued relating to water treatment o New chlorination systems– 3 o Chlorination system upgrades– 9 o New arsenic removal system– 1 o New hydrogen peroxide secondary disinfection– 1 o New PWDUs– 5 o New WTPs– 1 o Water treatment plant upgrades– 1 (Gander – chloramine pilot project)
Source Alternatives	• Permits to Construct issued relating to water sources: o New wells– 1 o New or upgraded intake or screen house– 3

Level III

The management of drinking water depends on the contribution of several levels of government as well as the public.

The four components in Level III of the MBSAP are:
1. legislative and policy frameworks
2. public involvement and awareness
3. guidelines, standards and objectives
4. research and development

Legislative and Policy Frameworks

The legislation that governs public drinking water systems in the province includes the *Water Resources Act*, the *Municipal Affairs Act*, and the *Municipalities Act*. All of the legislation, policy directives, standards, and regulations are posted on the province's website. These three Acts contain broadly stated initiatives:

- the Water Resources Act regulates the administration of water rights, the protection of public water supply areas, and a range of construction, operation, and development permits pertaining to drinking water infrastructure and development that may impact public water supplies
- the Municipal Affairs Act administers the management of waterworks
- the Municipalities Act grants powers to municipalities for the construction, operation, and maintenance of water systems and for the allocation of funds for this work

Government also introduces regulations, guidelines and policy directives to provide more explicit direction for legislation.

Interdepartmental Cooperation

The Provincial Government's efforts to provide clean and safe drinking water are the result of the combined contributions of the departments of Municipal Affairs and Environment, Health and Community Services, and Service NL. Each department is responsible for various aspects of the MBSAP. Their efforts are coordinated by an interdepartmental committee of Ministers, which is chaired by the Minister of Municipal Affairs and Environment. This committee met once in 2015–16. The committee's work is supported by the committee of deputy ministers and the Interdepartmental Safe Drinking Water Technical Working Group, which was formed in June 2000. The committee of deputy ministers met twice in 2015–16. Medical Officers of Health and representatives from the Public Health Laboratory are also members of the working group. The working group met four times in 2015–16, with all activities reported to senior government officials. The working group leads work on the development of policy and guidelines relating to drinking water safety.

In 2015–16, the working group focused on the Quality Assurance/Quality Control of BWAs, and the development of water treatment standards.

Public Involvement and Awareness

The department continues to provide accessible and timely drinking water quality information to the public. The department's website is a major tool for increasing public awareness and encouraging public involvement. Watershed management committees are another way the public can participate in efforts to ensure clean and safe drinking water supplies. They are excellent forums in which stakeholders can voice opinions and concerns about land management and water quality issues in their watershed areas. The establishment of watershed management committees furthers the goals of increasing public involvement and awareness of drinking water safety issues.

Videos for the following drinking water related topics can be found on the NL Water Resources channel at www.youtube.com/user/NLWaterResources

- A video addressing common questions relating to Permits to Construct water and sewer infrastructure in Newfoundland and Labrador
- A video addressing common questions relating to Permits for Development in PPWSAs in Newfoundland and Labrador
- A video addressing common questions relating to Permits to Operate for water and sewer infrastructure in Newfoundland and Labrador

Guidelines, Standards and Objectives

To ensure clean and safe drinking water, the department sets drinking water safety guidelines, standards, and objectives, and regularly reviews and updates them to address current issues and challenges. Guidelines, standards and objectives currently available on the website, www.mae.gov.nl.ca/waterres/regulations/index.html, include:

- *Bacteriological Quality of Drinking Water*
- *Standards for Chemical and Physical Monitoring*
- *Guidelines for the Design, Construction and Operation of Water and Sewerage Systems*
- *Chlorination Equipment Selection Guidelines*
- *Best Management Practices for the Control of Disinfection by-Products in Drinking Water Systems in Newfoundland and Labrador*
- *Guidelines for Disinfecting Dug and Drilled Wells*
- *Guidelines for Sealing Groundwater Wells*
- *Selection Criteria and Guidelines for the Design, Construction and Operation of Potable Water Dispensing Units*

Research and Development

In order to stay on top of current and emerging issues that affect drinking water safety, the department undertakes several research and development activities each year. During 2015–16, the following studies were implemented:

- *Development of Standard Operating Procedures for the Reduction of Boil Water Advisories*

Web Links

Department of Municipal Affairs and Environment
www.mae.gov.nl.ca/index.html

Newfoundland and Labrador Water Resources Act SNL 2002 cW-4.01
www.assembly.nl.ca/Legislation/sr/statutes/w04-01.htm

Water Resources Management Division Reports and Publications
www.mae.gov.nl.ca/waterres/reports/index.html

Newfoundland and Labrador Water Resources Portal
http://www.mae.gov.nl.ca/waterres/portal.html

Protected Water Supply Area List and GIS Layers
www.mae.gov.nl.ca/waterres/gis/index.html

Guidelines for Canadian Drinking Water Quality: Summary Table
www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/index-eng.php

Standards for Bacteriological Quality of Drinking Water
www.mae.gov.nl.ca/waterres/regulations/policies/standards_microbiological.html

Standards for Chemical and Physical Monitoring of Drinking Water
www.mae.gov.nl.ca/waterres/regulations/policies/physical_monitoring.html

Policy for Drinking Water Quality Monitoring and Reporting for Public Water Supplies
www.mae.gov.nl.ca/waterres/regulations/policies/water_quality.html

Department of Municipal Affairs and Environment Drinking Water Quality Data
www.mae.gov.nl.ca/waterres/quality/drinkingwater/chemical.html

Acts, Regulations, Policy Directives, and Water Quality Standards
www.mae.gov.nl.ca/waterres/regulations/policies/index.html

Education, Training, and Certification
www.mae.gov.nl.ca/waterres/training/index.html

Guidelines for the Design, Construction, and Operation of Water and Sewerage Systems
www.mae.gov.nl.ca/waterres/waste/groundwater/report.html

Best Management Practices for the Control of Disinfection By-products in Drinking Water Systems in Newfoundland and Labrador
www.mae.gov.nl.ca/waterres/reports/cwws/index.html

Notes

Notes

Municipal Affairs and Environment

Water Resources Management Division
Department of Municipal Affairs and Environment
Government of Newfoundland and Labrador
PO Box 8700, St. John's, NL
A1B 4J6

Alternate formats available upon request.